



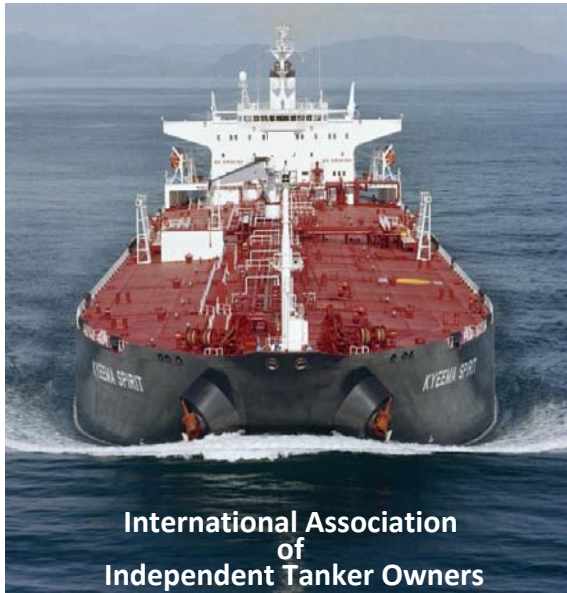
**INTERTANKO**

WMU 2017  
Malmö, Sweden

## **MARENER**

International  
Conference on  
Maritime Energy  
Management

Katharina Stanzel  
Managing Director  
INTERTANKO



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# Tanker Shipping



## ENERGY EFFICIENCY IN PRACTICE CHALLENGES & OPPORTUNITIES

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# Tanker Shipping

complex jobs, machinery & equipment, difficult environments  
expectations constantly adapting





## Technology Development Rules and Regulations

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## Environmental Concerns

**Life Cycle:**  
Newbuilding  
Decommissioning  
Recycling

VOCs  
Volatile Organic Compounds

CO<sub>2</sub>/GHG  
NO<sub>x</sub>, SO<sub>x</sub>, PM

Noise

**Quality Tanker Shipping**  
**Zero Fatalities, Zero Pollution, Zero Detentions**

Loss of containment

Biofouling  
Toxic Antifouling

Solid Waste  
Waste water  
Slops

Whales

Ballast water

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## Greenhouse Gas Emissions

- CO<sub>2</sub>
- Methane etc.

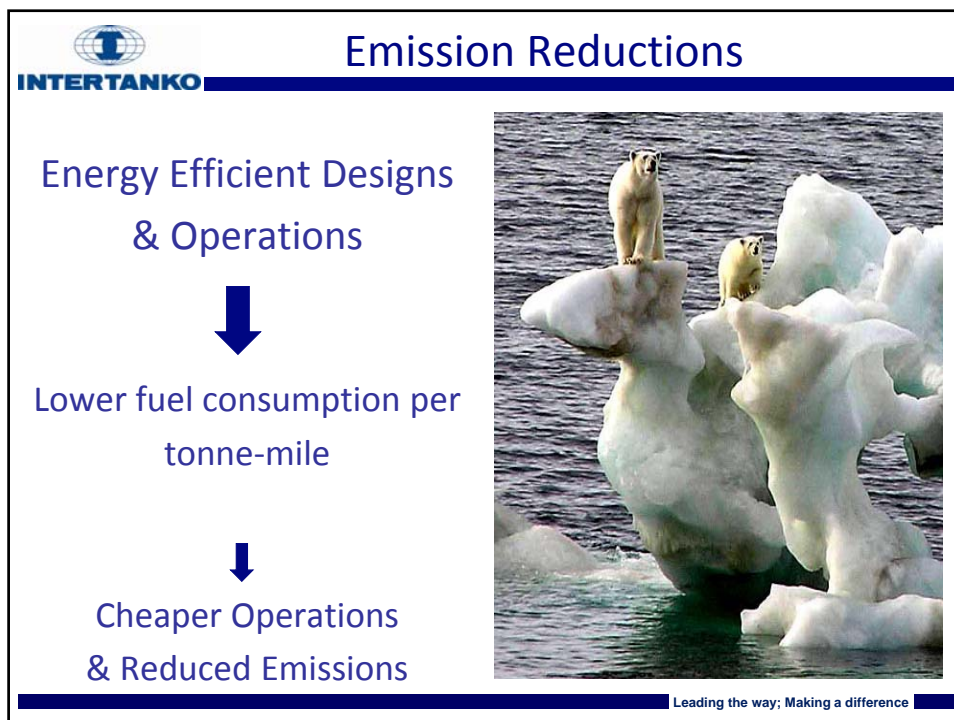
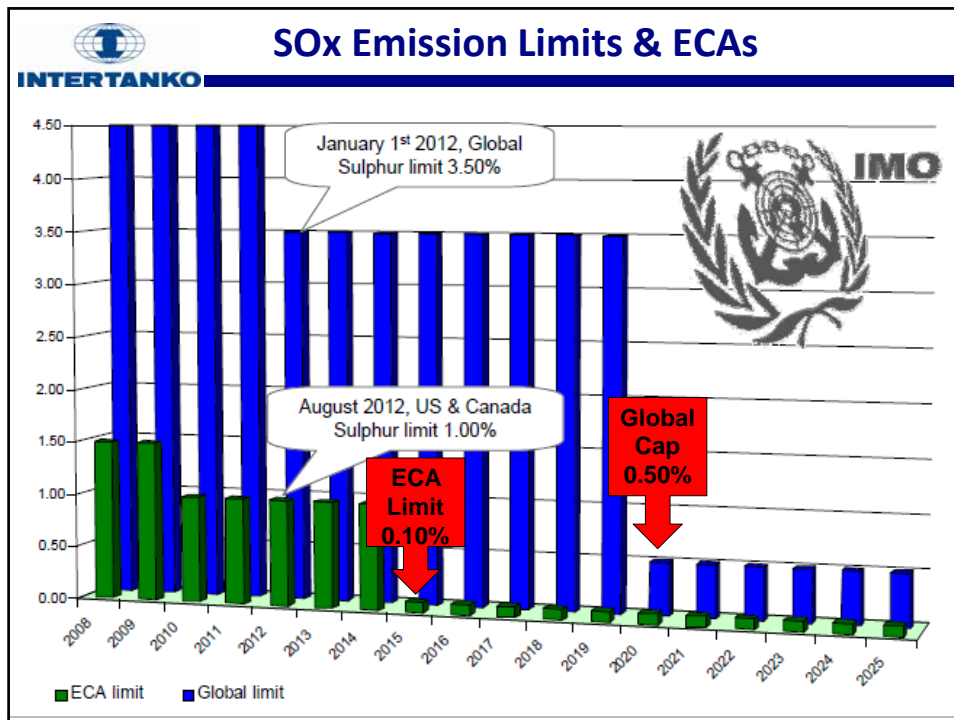
## Marpol Annex VI

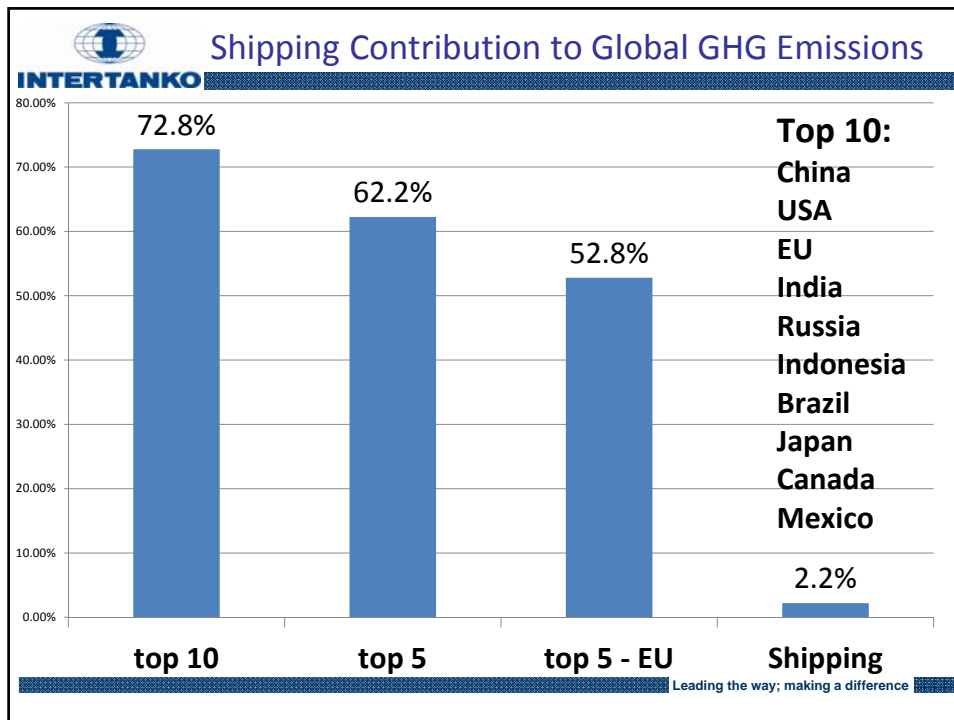
### Air Emissions

- SO<sub>x</sub>
- NO<sub>x</sub>
- PM

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**GHG Emission Reductions**

- IMO - EEDI (new buildings) & SEEMP (all ships)
- SEEMP - no target for GHG emissions reduction
- Amend MARPOL Annex VI
  - additional technical & operational measures to improve efficiency of ships in operation

Three step phase-in legislation

Phase I – data monitoring, reporting and verification (MRV)  
 NOW UNDERWAY: IMO rule development  
 EU regs adopted & enforced 1 July 2015

Phase II – trial period (verification of enforceability of target)

Phase III – enforcement

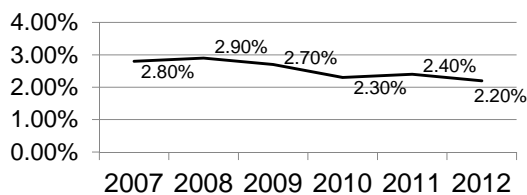
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## GHG Emission Reductions from Shipping - Facts

- Newbuilding Energy Efficiency Standards:
  - 10% BETTER IF BUILT IN 2015
  - 20% BETTER IF BUILT IN 2020
  - 30% BETTER IF BUILT IN 2025
- SEEMP = high improvement - 19% Reduction to global CO<sub>2</sub> emissions contribution in just 5 years



Fact:

CO<sub>2</sub> Emissions from Shipping reduced at much higher rate than landbased








Source: IMO 3<sup>rd</sup> GHG Study (2014)

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## Vessel Efficiency

		Fuel Savings / Applicable Voyage	Yearly Fleet Potential	Combined	Potential Emissions Reduction
SHIP RESISTANCE				10%	~140,000 tonnes of Fuel  ~420,000 tonnes of CO2  Source: TK
	Hull / Propeller Optimization (CASPER)	1.5 %	0.9%		
PROPULSION					
	Propeller Boss Cap Fin	5% (laden passage)	2.5%		
	Engine Optimization	2%	2.2%		
OPERATIONS					
	Cargo Heating	20% where applicable	1.0%		
	Trim Optimization	1% (specific voyages)	0.2%		
	Optimum Weather Routing	2% (trans-oceanic voyages)	1.0%		
	Speed Optimization	20% (Slow steaming on select voyages)	1 - 4%		

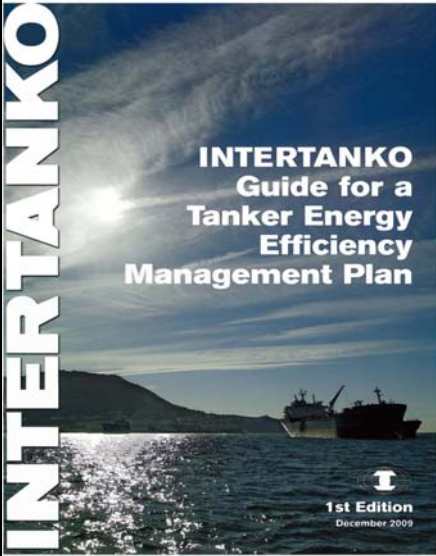
From ship design (EEDI) to operations (SEEMP)

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## Initiatives to reduce emissions




Best practice guidance TEEMP

Co-operation between members and other stakeholders

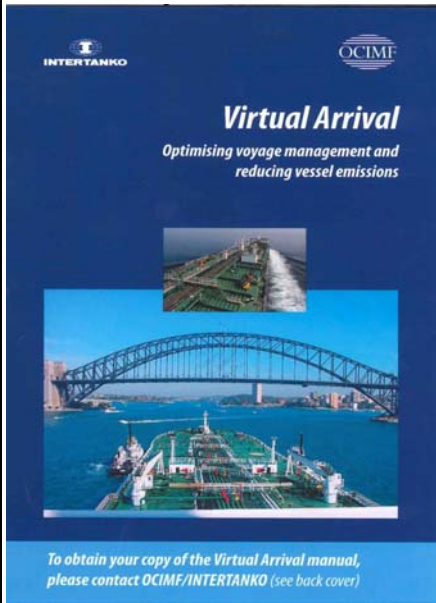
- Company TEEMP
- Voyage optimisation
- Propulsion resistance management
- Machinery optimisation
- Cargo handling optimisation

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## Initiatives to reduce emissions



### Virtual Arrival

- Reduce emissions by adapting vessel speed to terminal slots
- Uses inefficiencies in the market, but does not affect the market
- Reduces port congestion and contributes to improve safety

Co-operation between OCIMF and INTERTANKO

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## UCL Study for INTERTANKO

**A Case Study of Fuel Monitoring and Efficiency Indicators for INTERTANKO**

**Eoin O'Keeffe and Tristan Smith**

July 2016

### Executive Summary

The study investigates the CO<sub>2</sub> emissions and other relevant data collected over a five-year period from 11 "identical ships", namely ships:

- built according to the same design
- built by the same shipyard
- operated by the ship management company
- having similar systems for measuring and obtaining data.

These ships have same Estimated Index Values but they have variable operational performance as expressed through their annual EEOIs. Since these ships are identical and operated by the same ship operator, they do represent a unique opportunity to better understand their CO<sub>2</sub> emissions and to identify the impact that some important environmental, commercial and contractual factors have on their operational performance. To that extent, the study provides direct measurable challenges and obstacles to determine a simple methodology to assess the operational efficiency of a ship.

The data collected reveals a poor relationship between individual ship's total annual CO<sub>2</sub> emissions and their EEOI values. In one case, the ship with the highest amount of CO<sub>2</sub> emissions over one year was also the ship with the lowest (best) EEOI.

Up to 60% of the variation in EEOI values is due to contractual factors such as speed, total amount of cargo carried and the share between laden and ballast voyages. The remaining 40% of the variability on the EEOI values could be attributed to: the environmental conditions (sea state and the climate in which the ship operates), the commercial conditions (e.g. nature of cargo, the calorific value of fuel used) and the

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